REMARKS

In the last Office Action, the Examiner rejected claims 1, 8, 12-15, 18 and 20 under 35 U.S.C. §103(a) as being unpatentable over applicants' prior art disclosure in Fig. 14 ("APD") in view of U.S. Patent Publication No. 2004/0017454 to Yoshizawa et al. ("Yoshizawa") in view of U.S. Patent No. 6,447,186 to Oguchi et al. ("Oguchi"). Claims 2-7, 9-11, 16, 17 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over APD in view of Yoshizawa and Oguchi and further in view of U.S. Patent No. 5,210,547 to Watanabe et al. ("Watanabe").

In accordance with this response, claims 4 and 10 have been rewritten in independent form to incorporate the subject matter of base claim 1 and corresponding intervening claims. Claims 4 and 10 have also been amended to further define the function of the one-way clutch recited in original claims 4 and 10 which prevents rotation of the discharge roller in a direction of rotation during movement of the adhesive sheet in a direction toward the thermally activating apparatus. The last line of independent claim 13 has been amended only to correct a minor informality by adding the article "the" before "transporting unit." Claims 1-3, 5-9, 11 and 12 have been canceled without prejudice or admission. Claims 4, 10 and 13-20 are currently pending in this application.

Applicants most respectfully request entry of the foregoing amendments since claims 4 and 10 are merely presented in independent form and define with more specificity the function of the one-way clutch, and claim 13 has been amended only to correct a minor informality. Thus, no further consideration or search is necessitated by the amendments. In addition, the amendments substantially narrow any appealable issues because they present the claims in a substantially narrowed form and cancel a significant number of other claims. Thus, entry of the foregoing amendments does not impose a burden on the Examiner and should not be denied.

Applicants request reconsideration of their application in light of the following discussion.

Brief Summary of the Invention

The present invention is directed to a printer for a thermally sensitive adhesive sheet.

Fig. 14 shows a conventional printer incorporating a printing unit 30 for printing on a printable surface of a thermally sensitive adhesive sheet 21, and a thermally activating unit 50 for heating a thermally sensitive adhesive layer of the adhesive sheet 21. As described in the specification (pgs. 1-4), the conventional printer has a complicated transporting mechanism for transporting the adhesive sheet 21 from the printing unit 30 to the thermally

activating unit 50. For example, the conventional transporting mechanism has been unable to prevent unwanted slack in the adhesive sheet 21 between the printing unit 30 and the thermal activating unit 50.

The present invention overcomes the drawbacks of the conventional art. Figs. 1-3 show a printer P1 according to an illustrative embodiment of the present invention embodied in the claims. The printer P1 has a printing unit 30 for printing on a printable surface of a thermally sensitive adhesive sheet 21 having a thermally sensitive adhesive layer formed on a surface opposite to the printable surface, and first transporting means (e.g., roller 33, stepping motor 110, and drive mechanism shown in Fig. 2) for transporting the thermally sensitive adhesive sheet 21 in a first predetermined direction (e.g., in a direction forwardly of the printing unit 30) and a second predetermined direction (e.g., in a direction rearwardly of the printing unit 30). A cutter apparatus 40 cuts the thermally sensitive adhesive sheet 21 by a predetermined length after a printing operation by the printing unit 30. A thermally activating unit 50 is disposed at a preselected distance from the cutter apparatus 40 for heating the thermally sensitive adhesive layer of the thermally sensitive adhesive sheet 21. The thermally activating unit 50 has second transporting means (e.g., roller 53 and stepping motor 111) for transporting the thermally

sensitive adhesive sheet 21 in the first predetermined direction.

According to the illustrative embodiment of the present invention, the printer further comprises third transporting means for transporting the thermally sensitive adhesive sheet 21 in the first predetermined direction between the cutter apparatus 40 and the thermally activating unit 50, and control means (e.g., CPU 100 via stepping motors 110, 111) for independently controlling the first and second transporting means to thereby independently control a transporting speed of the thermally sensitive adhesive sheet 21 during transportation thereof by the first and second transporting means.

The third transporting means comprises at least one discharge roller 61, a pressing member 62 for pressing the thermally sensitive adhesive sheet 21 against the discharge roller 61 when the thermally sensitive adhesive sheet 21 is transported between the pressing member 62 and the discharge roller 61, and a drive mechanism (e.g., gears G1-G6) for rotationally driving the discharge roller 61 in a first direction of rotation (e.g., counterclockwise direction as shown in Fig. 1) while the pressing member 62 presses the thermally sensitive adhesive sheet 21 to transport the thermally sensitive adhesive sheet 21 in the first predetermined direction. The discharge roller 61 is

connected to the drive mechanism via a one-way clutch 63 so that when the first transporting means transports the thermally sensitive adhesive sheet 21 in the second predetermined direction, the drive mechanism does not rotate the discharge roller in a second direction of rotation (e.g., clockwise direction as shown in Fig. 1) opposite to the first direction of rotation.

By the foregoing construction of the printer according to the present invention, the third transporting means effectively transports the thermally sensitive adhesive sheet between the printing unit and the thermally activating unit without causing unwanted slack of the thermally sensitive adhesive sheet therebetween. Furthermore, the control means is able to provide for independent control of the first and second transporting means so that the transporting speed of the thermally sensitive adhesive sheet at the printing unit and the thermally activating unit, respectively, in the predetermined direction can be independently controlled. Additionally, by connecting the discharge roller of the third transporting means to the drive mechanism via a one-way clutch, rotation of the discharge roller in a direction tending to transport the thermally sensitive adhesive sheet toward the printing apparatus is prevented. Thus, a reliable transfer of the thermally sensitive adhesive sheet from the printing unit to the thermally activating unit is insured.

Traversal of Prior Art Rejections

Claims 13-15, 18 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over APD in view of Yoshizawa and further in view of Oguchi. Applicants respectfully traverse this rejection and submit that the combined teachings of APD, Yoshizawa and Oguchi do not disclose or suggest the subject matter recited in independent claim 13 and dependent claims 14, 15, 18 and 20.

Independent claim 13 is directed to a printer and requires a printing unit for printing during a printing operation on a printable surface of a thermally sensitive adhesive sheet having a thermally sensitive adhesive layer formed on a surface opposite to the printable surface, a first transporting mechanism for transporting the thermally sensitive adhesive sheet through the printing unit, a thermally activating unit for heating the thermally sensitive adhesive layer of the thermally sensitive adhesive sheet, a second transporting mechanism for transporting the thermally sensitive adhesive sheet through the thermally activating unit, a third transporting mechanism for transporting the thermally sensitive adhesive sheet from the printing unit to the thermally activating unit, and control means for controlling the first and third transporting mechanisms as a transporting unit to transport the thermally sensitive adhesive sheet at a preselected speed, and for independently

controlling the transporting unit and the second transporting mechanism to thereby independently control the preselected speed and a transporting speed of the thermally sensitive adhesive sheet during transportation thereof by the transporting unit and the second transporting mechanism.

Thus independent claim 13 recites "control means" for controlling the first and third transporting mechanisms as a transporting unit to transport the thermally sensitive adhesive sheet at a preselected speed, and for independently controlling the transporting unit and the second transporting mechanism to thereby independently control the preselected speed and a transporting speed of the thermally sensitive adhesive sheet during transportation thereof by the transporting unit and the second transporting mechanism. Under the guidelines set forth by the Court of Appeals for the Federal Circuit, means-plus-function language in a claim must be construed to cover the structure described in the specification, and equivalents thereof, to the extent that the specification provides such disclosure. In re Donaldson Co., Inc., 29 USPQ2d 1845, 1849 (Fed. Cir. 1994). When claim 13 is construed in this manner, the claimed "control means" must be construed to cover the structure recited in the specification and equivalents thereof.

An embodiment of the structure of the "control means" recited in independent claim 13 is disclosed by the

printer described on page 18, line 17 to page 20, line 1, of the specification and shown in Fig. 3. The "control means" comprises a CPU 100 for controlling the transporting mechanisms (e.g., rollers 33, 61 and 53) via stepping motors 110, 111. No corresponding structure is disclosed or suggested by the combined teachings of the cited references.

Moreover, unless the "control means" disclosed by Oguchi performs the identical functions specified in independent claim 13, it cannot be an equivalent for the purposes of Section 112, 6th paragraph. Pennwalt Corp. v. Durand-Wayland, Inc., 4 USPQ2d 1737 (Fed. Cir. 1987). In this regard, there is no teaching or suggestion in the cited references, either alone or in combination, of control means for controlling the first and third transporting mechanisms as a transporting unit to transport the thermally sensitive adhesive sheet at a preselected speed, and for independently controlling the transporting unit and the second transporting mechanism to thereby independently control the preselected speed and a transporting speed of the thermally sensitive adhesive sheet during transportation thereof by the transporting unit and the second transporting mechanism", as recited in independent claim 13.

The primary reference to APD discloses a printer as described in the specification (pgs. 2-4) and shown in Fig. 14. The Examiner cited the secondary reference to Yoshizawa

for its disclosure of first transporting means 21 for transporting an image receiving medium 1 through a printing unit (recording head 3), second transporting means 42 for transporting the image receiving medium 1 through a heat activating unit 41-43, and rollers 71, 72 as third transporting means for transporting the image receiving medium 1 from the printing unit to the heat activating unit 41-43.

As recognized by the Examiner, the combined teachings of APD and Yoshizawa do not disclose or suggest control means for independently two transporting mechanisms. However, the control function performed by the control means recited in independently claim 13 requires more than the independent control of two transporting mechanisms. More specifically, with reference to the embodiment shown in Figs. 1-3, for example, claim 13 requires a first transporting mechanism (e.g., roller 33, stepping motor 110, and drive mechanism G1-G6) for transporting the thermally sensitive adhesive sheet through the printing unit, a second transporting mechanism (e.g., roller 53 and stepping motor 111) for transporting the thermally sensitive adhesive sheet through the thermally activating unit, and a third transporting mechanism (e.g., discharge roller 61, pressing member 62, and drive mechanism G1-G6) for transporting the thermally sensitive adhesive sheet from the printing unit to the thermally activating unit.

Claim 13 further requires that the control means perform the following two control functions:

(a) controlling the first and third transporting mechanisms as a transporting unit to transport the thermally sensitive adhesive sheet at a preselected speed; and

(b) independently controlling the transporting unit and the second transporting mechanism to thereby independently control the preselected speed and a transporting speed of the thermally sensitive adhesive sheet during transportation thereof by the transporting unit and the second transporting mechanism.

Thus claim 13 requires that the control means controls the first transporting mechanism, which transport the thermally sensitive adhesive sheet through the printing unit, and the third transporting mechanism, which transports the thermally sensitive adhesive sheet from the printing unit to the thermally activating unit, as a transporting unit for the purpose of transporting the thermally sensitive adhesive sheet at a preselected speed. Claim 13 further requires that the control means independently controls the transporting unit and the second transporting mechanism, which transports the thermally sensitive adhesive sheet through the thermally activating unit, to thereby independently control the preselected speed and a transporting speed of the thermally sensitive adhesive sheet during transportation thereof by the

transporting unit and the second transporting mechanism. As recognized by the Examiner, no corresponding control functions are disclosed or suggested by the combined teachings of APD and Yoshizawa.

The Examiner cited the reference to Oguchi for its disclosure of a printing apparatus having a transportation controller 3b for controlling ejection rollers 15, 16 (transporting mechanisms) as a transporting unit, and a transportation controller 3a for controlling a feed roller 14 (transporting mechanism) so that the ejection rollers 15, 16 and the feed roller 14 are driven and stopped independently of each other (col. 4, lines 56-62).

However, applicants respectfully submit that Oguchi does not disclose or suggest the foregoing two specific control functions (a) and (b) of the control means recited in claim 13. More specifically, in Oguchi the ejection rollers 15, 16 are controlled as a unit by the transportation controller 3a for the purpose of grabbing the leading end part of roll paper R advanced by the feed roller 14 and advancing the paper R toward paper exit 11 (col. 4, lines 29-33). Thus the transportation controller 3a does <u>not</u> control as a unit two transportation mechanisms which <u>transport a thermally sensitive adhesive sheet through a printing unit</u> and <u>transports the thermally sensitive adhesive sheet from the printing unit to a thermally activating unit</u> respectively, as

required by the foregoing control function (a) recited in independent claim 13.

Likewise, the transportation controllers 3a and 3b in Oguchi clearly do not provide for independent control of a transporting unit (i.e., which perform the foregoing transporting function recited in claim 13) and another transporting mechanism which transports the thermally sensitive adhesive sheet through the thermally activating unit, and further for the purpose of independently controlling the preselected speed and a transporting speed of the thermally sensitive adhesive sheet during transportation thereof by the transporting unit and the second transporting mechanism, as recited in claim 13. For example, in Oguchi the feed roller 14 does not transport the paper R through a thermally activating unit.

Accordingly, the combination of features required by independent claim 13 are not taught or suggested by the combined teachings of APD, Yoshizawa and Oguchi and, therefore, one ordinarily skilled in the art would not have been led to modify the references to attain the claimed subject matter. See, inter alia, In re Fine, 5 USPQ2d 1596, 1598, (Fed. Cir. 1988), and Uniroyal, Inc. v. Rudkin-Wiley Corp., 5 USPQ2d 1434, 1439 (Fed. Cir. 1988), cert. denied.

Claims 14, 15, 18 and 20 depend on and contain all of the limitations of independent claim 13 and, therefore, distinguish from the references at least in the same manner as claim 13.

In view of the foregoing, applicants respectfully request that the rejection of claims 13, 14, 14, 18 and 20 under 35 U.S.C. §103(a) as being unpatentable over APD in view of Yoshizawa and further in view of Oguchi be withdrawn.

Claims 4, 10, 16, 17 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over APD in view of Yoshizawa and Oguchi and further in view of Watanabe. Applicants respectfully traverse this rejection and submit that the combined teachings of APD, Yoshizawa, Oguchi and Watanabe do not disclose or suggest the subject matter recited in amended claims 4 and 10 and dependent claims 16, 17 and 19.

APD in view of Yoshizawa and Oguchi does not disclose or suggest the subject matter recited in independent claim 13 as set forth above for the rejection of independent claim 13 under 35 U.S.C. §103(a). Claims 16, 17 and 19 depend on and contain all of the limitations of independent claim 13 and, therefore, distinguish from the references at least in the same manner as claim 13.

Claims 4 and 10 have been rewritten in independent form to include all of the limitations of base claim 1 and corresponding intervening claims. Independent claim 4

requires a printing apparatus comprising first transporting means for transporting the thermally sensitive adhesive sheet in a first predetermined direction and in a second predetermined direction opposite to the first predetermined direction, and a thermally activating apparatus comprising second transporting means for transporting the thermally sensitive adhesive sheet in the first predetermined direction. Amended claim 4 further requires third transporting means for transporting the thermally sensitive adhesive sheet in the first predetermined direction between the cutter apparatus and the thermally activating apparatus, the third transporting means comprising at least one discharge roller, a pressing member for pressing the thermally sensitive adhesive sheet against the discharge roller when the thermally sensitive adhesive sheet is transported between the pressing member and the discharge roller, and a drive mechanism for rotationally driving the discharge roller in a first direction of rotation while the pressing member presses the thermally sensitive adhesive sheet to transport the thermally sensitive adhesive sheet in the first predetermined direction, the discharge roller being connected to the drive mechanism via a one-way clutch so that when the first transporting means transports the thermally sensitive adhesive sheet in the second predetermined direction, the drive mechanism does not rotate the discharge roller in a second direction of rotation

opposite to the first direction of rotation. Claim 4 further requires control means for independently controlling the first and second transporting means to thereby independently control a transporting speed of the thermally sensitive adhesive sheet during transportation thereof by the first and second transporting means. No corresponding structural and functional combination is disclosed or suggested by the prior art of record.

APD in view of Yoshizawa and Oguchi do not disclose or suggest the structure and corresponding function of the control means recited in amended claim 4 as set forth above for independent claim 13.

The Examiner cited the reference to Watanabe for its disclosure of an image printing method and system having third transporting means including at least one discharge roller connected to a drive mechanism via a one-way clutch. As recognized by the Examiner, Watanabe also does not disclose or suggest the structure and corresponding function of the control means recited in amended claim 4 as set forth above for independent claim 13.

Moreover, Watanabe does not disclose or suggest a transporting system including a discharge roller connected to a drive mechanism via a one-way clutch <u>for transporting a thermally sensitive adhesive sheet in a predetermined direction between a cutter apparatus and a thermally</u>

activating apparatus, as recited in claim 4. In Watanabe a discharge roller 27 is connected to a gear 64 (drive mechanism) via a one-way clutch 72 (Fig. 3). The only transporting function of the discharge roller 27 and gear 64 is to discharge printing paper 7 to a cutter block 4 (Fig. 2). Thus the discharge roller 27 and the gear 64 of Watanabe do not correspond to the discharge roller and the drive mechanism of the third transporting means recited in claim 4, which specifically function to transport the thermally sensitive adhesive sheet between a cutter apparatus and a thermally activating apparatus.

Watanabe also does not disclose or suggest the specific structural and functional relationship between the first and third transporting means (e.g., discharge roller, drive mechanism), including the specific function of the one-way clutch connecting the discharge roller to the drive mechanism, as recited in amended independent claim 4. More specifically, claim 4 requires that the third transporting means (e.g., discharge roller and drive mechanism) transports the thermally sensitive adhesive sheet in a first predetermined direction between the cutter apparatus and the thermally activating apparatus. Claim 4 further recites that the second predetermined direction is a direction opposite to the first predetermined direction, and that the discharge roller is connected to the drive mechanism via a one-way

clutch so that when the first transporting means transports the thermally sensitive adhesive sheet in the second predetermined direction, the drive mechanism does not rotate the discharge roller in a second direction of rotation opposite to the first direction of rotation.

Thus, while disclosing a discharge roller connected to a drive mechanism via a one-way clutch, Watanabe does not disclose or suggest the foregoing specific structural and functional relationship between the first and third transporting means, including the specific function of the one-way clutch in preventing rotation of the discharge roller in a specific direction of rotation relative to the predetermined transporting direction of the sensitive adhesive sheet.

Independent claim 10 requires a printing apparatus comprising first transporting means comprised of a platen roller for transporting the thermally sensitive adhesive sheet in a first predetermined direction and in a second predetermined direction opposite to the first predetermined direction, a thermally activating apparatus comprising second transporting means for transporting the thermally sensitive adhesive sheet in the first predetermined direction, and third transporting means comprising a discharge roller for transporting the thermally sensitive adhesive sheet in the first predetermined direction between the cutter apparatus and

the thermally activating apparatus. Claim 10 further requires that the first transporting means and the third transporting means comprise a drive mechanism for transporting the thermally sensitive adhesive sheet in the first predetermined direction, the drive mechanism having a stepping motor for rotationally driving the platen roller and the discharge roller in a first direction to transport the thermally sensitive adhesive sheet in the first predetermined direction. Claim 10 further requires that the discharge roller connected to the drive mechanism via a one-way clutch so that when the first transporting means transports the adhesive sheet in the second predetermined direction, the drive mechanism does not rotate the discharge roller in a second direction of rotation opposite to the first direction of rotation. No corresponding structural and functional combination is disclose or suggested by the prior art of record as set forth above for amended claim 4.

In view of the foregoing, applicants respectfully request that the rejection of claims 4, 10, 16, 17 and 19 under 35 U.S.C. §103(a) as being unpatentable over APD in view of Yoshizawa and Oguchi and further in view of Watanabe be withdrawn.

Applicants most respectfully request entry of the foregoing amendments since claims 4 and 10 are merely presented in independent form and define with more specificity

the function of the one-way clutch, and claim 13 has been amended only to correct a minor informality. Thus, no further consideration or search is necessitated by the amendments. In addition, the amendments substantially narrow any appealable issues because they present the claims in a substantially narrowed form and cancel a significant number of other claims. Thus, entry of the foregoing amendments does not impose a burden on the Examiner and should not be denied.

In view of the foregoing amendments and discussions, the application is now believed to be in allowable form. Accordingly, entry of this amendment and favorable reconsideration and passage of the application to issue are most respectfully requested.

Respectfully submitted,

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